What is claimed is:

1. A data transmission method in a relay transmission type radio network including a core node connected to a wire network, relay nodes relaying a down-link packet transmitted from said core node and an up-link packet directed toward said core node and a terminal station capable of transmission and reception of packet with both of said core node and said relay node, comprising:

a registration step for registering with a relay node list held by the node, as a pair, ID information on said terminal station and a relay source node included in the up-link packet transmitted by said terminal station, in each of said core node and said relay node; and

a selection step for selecting a down-link relay route of the down-link packet addressed to said terminal station on the basis of said relay node list, in each of said core node and said relay node.

2. The data transmission method according to claim 1, comprising:

a step for periodically transmitting a broadcast packet to said terminal station in each of said core node and said relay node;

a connection node determination step for receiving said broadcast packet and determining a connection node out of said core node and said relay node in said terminal station;

a step for transmitting to said connection node an up-link ACK packet, as said up-link packet, including the ID information on said terminal station and directed toward said core node following a predetermined up-link relay route in said terminal station; and

a step for, in each of said relay nodes, setting on said received up-link ACK packet the ID information on the relay node as the ID information on said relay source node and transmitting it to a relay destination node.

3. The data transmission method according to claim 2, wherein said connection node determination step determines as said connection node a node that transmitted said broadcast packet having the highest received power or the best received quality.

4. The data transmission method according to claim 2, wherein said broadcast packet includes the ID information on the node that transmitted the broadcast packet.

5. The data transmission method according to claim 2, wherein said broadcast packet includes the ID information on the core node on which the node that transmitted the broadcast packet is dependent.

6. The data transmission method according to claim 2, wherein, in the relay node having received said up-link ACK packet, if the pair of the ID information on said terminal station and said relay source node included in the up-link ACK packet is already

registered with said relay node list held by the relay node, the up-link ACK packet is not transmitted to the relay destination node.

7. The data transmission method according to claim 2, wherein said registration step immediately registers the ID information on said terminal station and said relay source node included in said received up-link ACK packet as a pair, and if the ID information on said terminal station is already registered with said relay node list as a pair with the ID information different from that of the relay source node, the ID information on the terminal station registered as the pair with the different ID information is deleted immediately or after a predetermined time elapses.

8. The data transmission method according to claim 1, wherein the pair of the ID information on said terminal station and said relay source node registered with said relay node list is deleted after a predetermined time elapses from the registration thereof.

9. The data transmission method according to claim 2, wherein said broadcast packet is transmitted with predetermined transmitting power.

10. The data transmission method according to claim 2, wherein said up-link ACK packet is transmitted by controlling the transmitting power thereof so as to satisfy predetermined

received power or predetermined received quality at the relay destination node thereof.

11. The data transmission method according to claim 1, comprising a step for, in each of said relay nodes, setting on said received up-link ACK packet the ID information on the relay node as the ID information on said relay source node and transmitting it to relay destination nodes.

12. The data transmission method according to claim 1, wherein said selection step comprises:

a step for checking the ID information on said terminal staion included in said down-link packet addressed to said terminal station and detecting the relay node that pairs off with said terminal station from said relay node list; and

a step for transmitting said down-link packet to the detected relay node in the sase where the relay node that pairs off with said terminal station is detected and transmitting said down-link packet dierctly to said terminal station in the case where the relay node that pairs off with said terminal station is not detected.

13. The data transmission method according to claim 11, wherein, in the relay node having received said up-link packet, if the pair of the ID information on said terminal station and said relay source node included in the up-link packet is already registered with said relay node list held by the relay node,

the up-link packet is not transmitted to the relay destination node.

14. The data transmission method according to claim 11, wherein the pair of the ID information on said terminal station and said relay source node registered with said relay node list is deleted after a predetermined time elapses from the registration thereof.

15. The data transmission method according to claim 11, wherein said up-link packet is transmitted by controlling the transmitting power thereof so as to satisfy predetermined received power or predetermined received quality at the relay destination node thereof.

16. The data transmission method according to claim 1, wherein said down-link packet is transmitted by controlling the transmitting power thereof so as to satisfy predetermined received power or predetermined received quality at the relay node or said terminal station receiving the down-link packet.

17. The data transmission method according to claim 11, wherein said registration step immediately registers the ID information on said terminal station and said relay source node included in said received up-link packet as a pair, and if the ID information on said terminal station is already registered with said relay node list as a pair with the ID information different from that of the relay source node, the ID information on the terminal

station registered as the pair with the different ID information is deleted immediately or after a predetermined time elapses.

18. A relay node relaying a down-link packet transmitted from a core node connected to a wire network and an up-link packet directed toward said core node, and capable of communication with a terminal station, comprising a relay node list for having recorded ID information on said terminal station and a relay source node included in the up-link packet directed toward said core node by said terminal station and giving a down-link relay route of the down-link packet addressed to said terminal station on the basis of said ID information.

19. A core node connected to a wire network, and capable of transmission and reception of packet with both of a terminal station and a relay node, comprising a relay node list for having recorded ID information on said terminal station and the relay node that is a relay source node included in a received up-link packet and giving a down-link relay route of a down-link packet addressed to said terminal station on the basis of said ID information is provided.

20. A terminal station capable of transmission and reception of packet with both of a core node connected to a wire network and a relay node relaying a down-link packet transmitted from said core node and an up-link packet directed toward said core node, setting ID information on a source terminal station registered with a relay node list of said core node or said relay

node as a pair with ID information on a relay source node on said up-link packet and transmitting said up-link packet to a relay destination node.